Original Article

Knowledge Attitude and Practice Survey on non-vital bleaching among dental practitioners and specialists

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Abstract

Aim -This study is to evaluate the preferences of general dentists regarding the vital and nonvital tooth bleaching therapies and investigate whether the time of clinical practice and post-graduate training has influenced these options or not .

Introduction The dental practice in today's time is a combination of treatment and maintenance of esthetics. People consider whiteness of teeth as an important component for achieving self-esteem and confidence; discolored teeth significantly impacts on physical, psychological, and social aspects of individuals' quality of life.

Materials and methods A cross-sectional study was conducted using a questionnaire with closed questions applied to dentists . The Information was collected regarding the sociodemographic variables, and level of specialization In addition the options regarding bleaching therapies including the first choice of material, technique and clinical practice for vital and nonvital tooth bleaching therapies are also included. The Data were submitted to descriptive analysis and the associations were evaluated using chi-square and Fisher exact tests .

Results The response rate was 68% . At-home bleaching therapy was broadly preferred over in-office bleaching. For at-home bleaching, most dentists answered to use 10% carbamide peroxide (CP) and >30% hydrogen peroxide (HP) for nonvital therapies. The majority of dentists with training preferred at-home bleaching techniques . At-home bleaching therapy was also more indicated by younger dentists. No association was found between the choice for nonvital bleaching therapies and time since graduation or continuous education.The P value = 0.392 (> 0.05) hence not statistically significant.

Conclusion It is found that carbamide peroxide is the most effective material for non vital bleaching.The discoloration of pulp chamber origin is an indication of internal bleaching in females than in males. Also dental practitioners and specialists prefer carbamide peroxide for non vital bleaching.

Key words: Tooth bleaching, Carbamide peroxide, Hydrogen peroxide

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INTRODUCTION

Bleaching treatments became very fashionable with the increasing demand for esthetics in practically all fields of lifestyle . Vital tooth bleaching is often performed externally in vital teeth, using at-home or in-office techniques, or both techniques together .Nonvital bleaching for a root-filled tooth is administered intracoronary or employing a combination of external and internal procedures . Several products and different techniques are available for tooth bleaching, with most variations concerning concentration and sort of peroxide releasing agents . Basically, the mechanism of action of bleaching agents is analogous(Lynch *et al.*, 2010; Hatherell *et al.*, 2011)(Honey *et al.*, 2011) . Peroxide-containing agents break down into water and oxygen, which diffuses through the dental structure, causing oxidation and reduction of organic pigments that are located mainly within the dentin structure, ultimately producing the whitening effect .(Messer and Calache, 2012; Duran, Martinez and Fabian, 2017)

Discoloration is the change within the hue, color, or translucency of a tooth. Tooth discolorations might be thanks to hereditary or environmental factors, age, or any underlying disease. it's going to even be trauma-induced or iatrogenic as a result of dental and medical treatment. Discoloration of the teeth might be extrinsic (Bailey and Christen, 1968)(Lynch, Ash and Chadwick, 2011) or intrinsic.The intrinsic discolorations are of concern ,owing to its integration into the tooth structure, while extrinsic discolorations are incorporated superficially on the tooth surface. Bleaching of the teeth may be a popular technique used for the treatment of discoloration(Topcu, Alabas and Oktay, 2017).(Poyser, Kelleher and Briggs, 2004; Topcu, Alabas and Oktay, 2017)

Bleaching may be a procedure that lightens the tooth color by oxidizing the organic discoloration within the tooth. It restores the physiological color and therefore the hue of a tooth, and removes the stain with an efficient oxidant , also referred to as a bleach . The effectiveness and efficacy of bleaching of the teeth depends upon the underlying explanation for the discoloration. The indication of bleaching procedure should be integrated into the ultimate treatment plan.(Elkins, 2007)

The non vital tooth bleaching is performed at the dental office by using strong peroxide agents, such as high concentration hydrogen peroxide (HP) or hydrogen peroxide-releasing agents (carbamide peroxide - CP and sodium perborate - SP) . The vital tooth bleaching can be performed with high concentration (in-office) or low concentration agents . Agent concentration and technique have been claimed to influence the bleaching outcome .(Elkins, 2007; Marson *et al.*, 2008; Alomari and El Daraa, 2010; Clancy, 2015)

There are some adverse effects reported on vital tooth bleaching are tooth sensitivity, gingival irritation, reduced adhesion to dental tissues and alterations in the dental structure . In non vital bleaching, the occurrence of external root resorption, morphological alterations in dental tissues, alteration of dental materials' properties and decrease of tooth resistance and adhesion have also been reported .('In-office dental bleaching with light vs. without light: A systematic review and meta-analysis', 2018)

Dentist's knowledge and clinical practices regarding different dental treatments have been investigated , but only one study has evaluated the choice of dentists regarding bleaching agents for non vital and vital treatments (Coldero *et al.*, 2002)(Reit and Dahlén, 1988). Our team has extensive knowledge and research experience that has translate into high quality publications (Dinesh *et al.*, 2013; Krishnan and Lakshmi, 2013; Muthukrishnan and Warnakulasuriya, 2018; Sekar *et al.*, 2019; Gomathi *et al.*, 2020) (Sathivel *et al.*, 2008; Panda *et al.*, 2014; Govindaraju, Neelakantan and Gutmann, 2017; Johnson *et al.*, 2020; Saraswathi *et al.*, 2020).This questionnaire-based survey was given to assess the preferred techniques and products to perform non vital and vital dental bleaching by a population of dentists. It was also investigated whether their options could be influenced by their time in clinical practice and the level of specialization.(Mariam *et al.*, 2013)(Araujo, Baratieri and Araújo, 2010).

MATERIAL AND METHODS

This cross-sectional study was performed for the dental practitioners and specialists . All the Data was collected through a self-applied questionnaire with closed questions. The variables are comprised of sociodemographic information (gender and skin color), professional characteristics (graduation time and level of specialization), attitudes and knowledge of different restorative procedures.

Continuous education information was dichotomized. The specialists are considered those who attend a formal post-graduation course (specialization, Master's or PhD degree), while non-specialists are those with a DDS degree only (general dentist).
The questionnaires were personally delivered to each dentist's office which were collected 1 week later together with the signed informed consent form. The loss of participants was considered when professionals did not return the questionnaire/informed consent form after two visits. The questionnaire was pre-tested with professionals that are not involved in the study.

The Data was submitted for descriptive analyses and the association between vital and nonvital tooth bleaching with independent variables was tested with chi-square or Fisher's exact test. The analyses were carried out with Stata 10.0 software (StataCorp, College Station, TX, USA).
Data Analysis
All the data were entered into the statistical analysis software SPSS (version 25.0; IBM Corp, USA). Descriptive statistics of frequency distribution and percentages were calculated for all questionnaire responses, and the most appropriate answers were noted to assess the overall knowledge of IBT among the study participants.

Results

It is found that for internal bleaching we have to put a barrier between root canal fillings and a bleaching material in thickness of 2mm which is shown in a bar chart (Fig-1) that represents association between gender and no. of people wants during internal bleaching to put a barrier between root canal fillings and a bleaching material in thickness of 2mm. X-axis represents gender and Y-axis represents the percentage of response. It is shown that the most commonly

used material in internal bleaching is carbamide peroxide. A bar chart (Fig-2) is shown that represents the association between the gender and the most commonly used material in internal bleaching . It is found that carbamide peroxide has been suggested for internal bleaching by both the male and female students. A bar chart (Fig-3) is shown that represents between the gender and carbamide peroxide that has been suggested for internal bleaching. It is found that discoloration of pulp chamber origin is an indication of internal bleaching by both of male and female students. A bar chart (Fig-4) represents the association between the gender and the discoloration of the pulp chamber origin in an indication of internal bleaching.

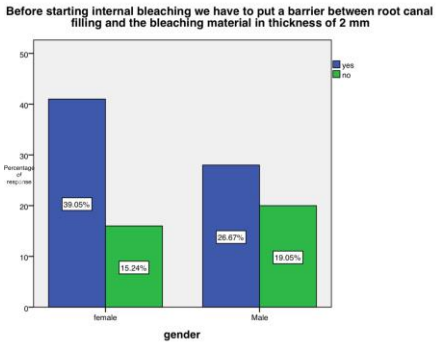

Figure1: Bar chart represents the association between gender and starting of internal bleaching to put a barrier between root canal filling end of bleaching material in thickness of 2mm. X-axis represents gender and Y-axis represents the percentage of response . Internal bleaching to put a barrier between root canal filling end of bleaching material in thickness of 2mm in both the male and female students. P value = 0.901 (>0.05), hence not statistically significant.

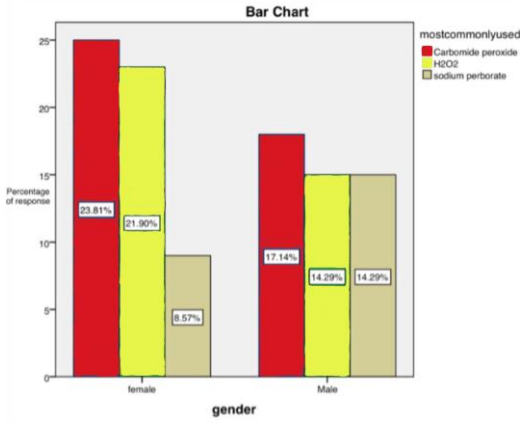

Figure 2: Bar chart represents the association between gender and most commonly used material in internal bleaching . X-axis represents gender and Y-axis represents the percentage of response . Most commonly used material in internal bleaching in both the male and female students. P value = 0.144 (> 0.05), hence not statistically significant.

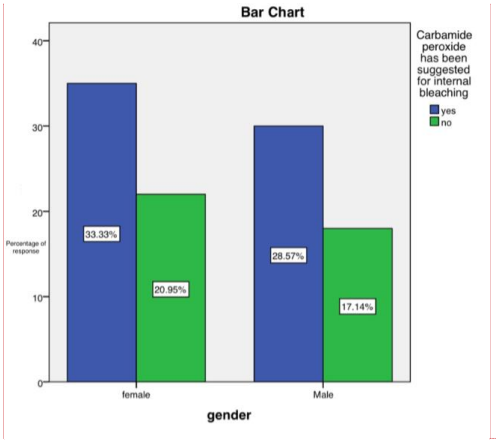

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Figure 3: Bar chart represents the association between gender and carbamide peroxide has been suggested for internal bleaching . X-axis represents gender and Y-axis represents the percentage of response. Carbamide peroxide has been suggested for internal bleaching by both the male and female students. P value = 0.837(>0.05), hence not statistically significant.

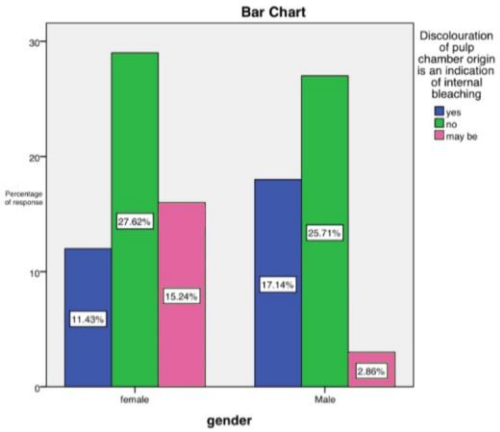

Figure 4: Bar chart represents the association between gender and discolouration of pulp chamber origin is an indication of internal bleaching. X-axis represents gender and Y-axis represents the percentage of response . Discolouration of pulp chamber origin is an indication of internal bleaching by both the male and female students. Chi square analysis, P value = 0.415(>0.05), hence not statistically significant.

DISCUSSION

The internal bleaching is a conservative and economic dental procedure that does not change the shape or position of the tooth on the dental arch. It is necessary to do an internal bleaching before the placement of all ceramic restorations. It assists in maintaining the natural color of the tooth abutment by allowing passage of through it, improving esthetic, physical, and social aspects of individuals' quality of life.(Jala *et al.*, 2017)(McCaul, McHugh and Saunders, 2001)(Hülsmann and Tulus, 2016)

Tooth staining differs in etiology, appearance, confinement, seriousness, and grip to tooth structure. It tends to be characterized as being extraneous or natural based on restriction and etiology. There are different reasons for tooth staining, distinctive fading materials, and their applications to endodontically treated teeth are depicted.
The fading procedure, the root filling ought to be finished first, and a cervical seal should be set up. The blanching specialist ought to be changed each 3-7 days. The thermocatalytic procedure includes arrangement of a dying specialist in the mash chamber followed by heat application. Toward the finish of each visit the blanching specialist is left in the tooth with the goal that it can work as a mobile dye until the following visit.
Outside fading of endodontically treated teeth with an in-office method requires a high fixation gel. It very well may be an enhancement to the strolling blanch procedure, if the outcomes are not agreeable after 3-4 visits. These medicines require a reinforced transitory filling or a fortified sap composite to seal the entrance hole. There is an insuffic iency of proof based science in the writing that tends to the anticipation of blanched nonvital teeth. Thus, it is critical to consistently know about the potential entanglements and dangers that are related with the diverse fading methods.
The most widely recognized reason for staining in non-imperative teeth is the presence of pulpal haemorrhagic items. The staining seen is believed to be because of the amassing of the breakdown results of hemoglobin or other haematin atoms from the mash, and generally follows injury. Staining can likewise be seen after endodontic mediation.
Prior to performing IBT, DPs should know that if the tooth to be bleached is treated endodontically with an adequate obturation, which is usually done using the suitable radiograph. A tooth may become non vital because of trauma and may lose its original color without being endodontically treated anytime. Also in such cases, that root canal treatment should be the first step in the treatment. If the tooth is endodontically treated, we can proceed with the internal bleaching procedure.
The highest percentage of responses in recent study reflected a good knowledge that sodium perborate was safer than concentrated hydrogen peroxide solutions and easily controlled. So therefore, in most cases, it should be the material of choice for IBT and this information is suggested by the dental practitioners(Araújo, Torres and de Araújo, 2010)). The drawbacks of the study were limited population. The future scope is to create awareness on non vital bleaching techniques and benefits among dental practitioners and specialists. (Payne, 2017)(Amato *et al.*, 2006)(Carratu *et al.*, 2002; Payne, 2017)

CONCLUSION

Within the limitations of the study, the results have revealed that the most commonly used material in internal bleaching is Carbamide peroxide by females compared to males . The discoloration of pulp chamber origin is an indication of internal bleaching in females than in males. For the internal bleaching they have to put a barrier between root canal filling and the bleaching material in thickness of 2 mm is preferred in females than in males. Therefore we can conclude that carbamide peroxide has efficacy, rapid esthetic result, and safety.

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Author's contribution: All the authors contributed equally in concept, designing, carrying out the research and analysis of the study

Conflict of Interest: The authors declare no conflict of interest

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